CITY OF HOWE (PWS 6120006)
SOURCE WATER ASSESSMENT FINAL REPORT

August 16, 2004

State of Idaho
Department of Environmental Quality

Disclaimer: This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for City of Howe, Howe, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The City of Howe (PWS #6120006) drinking water system consists of one well. The well was constructed in 1984 and is the main water supply serving the system's approximately 60 people through 25 connections.

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, both the City of Howe well rated high for IOCs, VOCs, SOCs, and moderate for microbials. System construction rated high and hydrologic sensitivity rated moderate for the well. Land use scores were high for IOCs, VOCs, SOCs, and moderate for microbials.

No SOCs or VOCs have ever been detected in the tested water. Traces of the IOCs fluoride, zinc, barium, beryllium, chromium, sodium, magnesium, calcium, iron, and zinc have been detected in the well. Other IOCs have been detected in the well, including Nitrate at concentrations of less than 1.4 ppm and arsenic in concentrations of 10 ppb. The MCL for nitrate is 10 ppm and arsenic's revised MCL is 10 ppb. The high arsenic concentration was detected in April 1998 in concentrations of 10 ppb which is equal to the revised MCL of 10 ppb. However, since 1998, arsenic has not been found in concentrations greater than 0.005 mg/L. Total coliform has been detected in the distribution system three times between July and September 1993, but no more detections have occurred since then.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use. For the City of Howe, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Actions should be taken to keep a 50-foot radius circle around the wellhead clear of potential contaminants. Any contaminant spills within the delineation should be carefully monitored and dealt with. As much of the designated assessment areas are outside the direct jurisdiction of City of Howe, collaboration and partnerships with state and local agencies should be established and are critical to success. Because the arsenic in the well is approaching the level of the revised MCL established by EPA in October 2001, the City of Howe water users may need to consider implementing engineering controls to monitor and maintain or reduce the level of this contaminant in the water system. The EPA provided up to $20 million over the last two years for research and development of more cost-effective technologies to help small systems meet the recently revised MCL. EPA (2002) released an issue paper entitled *Proven Alternatives for Aboveground Treatment of Arsenic in Groundwater*.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. As the Little Lost River is within the delineation, being on an emergency call list might be a consideration in case a spill ever occurred into the river. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineation; therefore the Department of Transportation should be involved in protection activities.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the DEQ or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR
CITY OF HOWE, HOWE, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the EPA to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments for sources active prior to 1999 were completed by May of 2003. SWAs for sources activated post-1999 are being developed on a case-by-case basis. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Howe (PWS #6120006) drinking water system consists of one well. The well was constructed in 1984 and is the main water supply serving the system's approximately 60 people through 25 connections.

No SOCs or VOCs have ever been detected in the tested water. Traces of the IOCs fluoride, zinc, barium, beryllium, chromium, sodium, magnesium, calcium, iron, and zinc have been detected in the well, as well as nitrate in concentrations less than 1.4 ppm and arsenic in concentrations of 10 ppb. The MCL for nitrate is 10 ppm and arsenic's revised MCL is 10 ppb. Total coliform has been detected in the distribution system three times between July and September 1993, but no more detections have occurred since then.

Defining the Zones of Contribution – Delineation

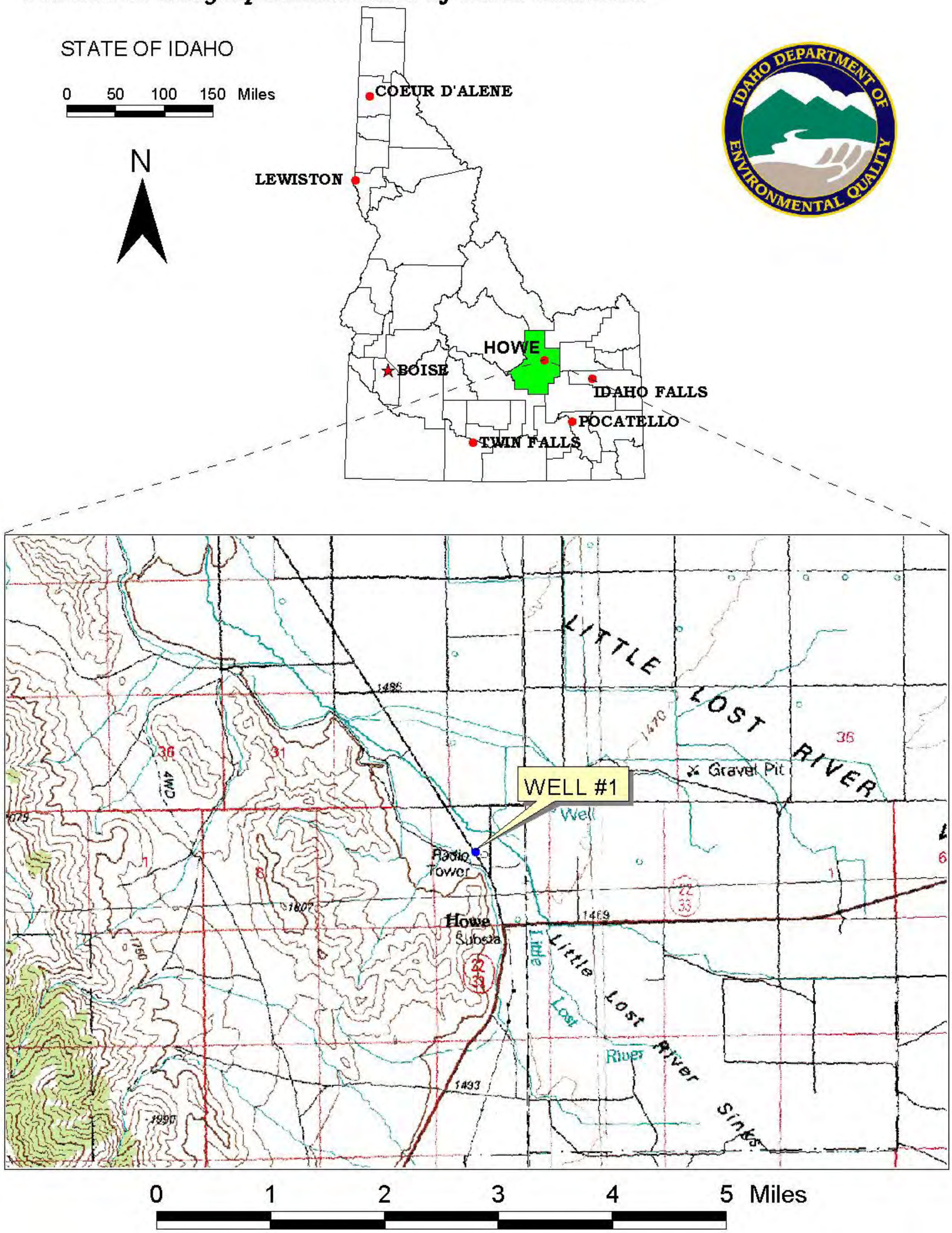
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ performed the delineation using a refined analytical element computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Little Lost River Valley aquifer in the vicinity of the City of Howe. The computer model used site specific data, assimilated by DEQ from a variety of sources including the City of Howe well log, other local area well logs, and hydrogeologic reports (detailed below).

Hydrogeologic Conceptual Model

The Little Lost River valley is an elongated, northwest trending intermontane basin that drains an area of about 900 square miles into a closed depression near the northwestern edge of the Snake River Plain (Clebsch et al., 1974, p.1). Runoff from snowmelt and rainfall on the Lost River Range to the west and the Lemhi Range to the east maintains the flow of the Little Lost River and recharges the ground water reservoir in the valley.

Stratified sedimentary and volcanic rocks make up the mountains and hills surrounding the basin and form the bedrock beneath the basin. Alluvial boulders, gravel, sand, and silt eroded from these older rocks fill the valley trough to various depths. This fill is coarser and less well sorted in the extensive colluvial fans along the valley margins than along the valley bottom where major through-flowing streams reworked the materials during their accumulation. East and southeast of Howe, some of the basalt flows of the Snake River Plain spread northwestward into the valley mouth and are interlayered with these sediments.

FIGURE 1. Geographic Location of Howe Townsite



The primary source of water to the alluvial aquifer is recharge from precipitation at higher elevations where infiltration occurs in the fractures of the rock outcrops. Some of the ground water discharges to streams; some ground water continues downslope until it enters the valley alluvium. Numerous streams lose all their flow to the highly permeable colluvial fans found at the edge of the valley floor. Precipitation on the valley floor is another source of recharge to the aquifer. Annual precipitation within the basin is highly elevation-dependent and varies from 8 inches near Howe to greater than 40 inches at elevations above 9,000 feet mean sea level (msl) (Clebsch et al., 1974, p.1).

The principal aquifers are the highly transmissive alluvial fill in the upper and middle valley and alluvial fill interfingered with basalt in the southernmost part of the valley. The valley alluvium contains a single water body under water table conditions. The water table gradient is fairly uniform, averaging about 43 feet per mile in the upper and middle valley. In the Howe area, the water table is approximately 200 feet beneath the land surface. A substantial part of the surface water entering this part of the basin infiltrates to the aquifer.

The potentiometric surface ranges in elevation from about 6,100 feet msl near Dry Creek to 4,550 feet south of Howe (Clebsch et al., 1974, Figure 2). Ground-water flow direction generally follows the valley centerline toward the southeast. Transmissivity values for the alluvial aquifer range from about 150,000 to 1,000,000 gal/day/ft (20,100 to 134,000 ft^2/day), and the storage coefficient is on the order of 0.15 to 0.2 (Clebsch et al., 1974, p. 1). The specific capacity of wells in the valley for which discharge and drawdown data are available ranges from 12 to 163 gpm/ft (Clebsch et al., 1974, p.35).

The Little Lost River is perched above the water table throughout most of the lower basin (Clebsch et al., 1974, p. 51). The average flow rate of the river at a gauging station near Howe for the period 1941 to 1967 is 50,000 acre-feet per year (69 ft3/sec) (Clebsch et al., p. 45). An estimated 40,000 acre-feet per year ends up recharging the aquifer downstream from Howe. This recharge occurs as direct seepage from the river and by infiltration of water that is diverted for irrigation.

The City of Howe well is located in the margin between the Little Lost River and the Snake River Plain. The driller's log indicates that the water-producing zone is composed of fractured limestone and that the specific capacity is 133 gpm/ft. Materials overlying the producing formation include basalt and various mixtures of clay and gravel. A continuous interval of clay was noted on the log from 103 to 128 ft-bgs.

CAPTURE ZONE MODELING

Method

The analytic element model WhAEM2000 (Kraemer et al., 2000) was used to delineate 3-, 6-, and 10-year capture zones for the PWS well located within the Little Lost River Valley hydrologic province. The method used for delineating hydraulic capture zones contains four main elements:

Model Input Determination

Specific capacity data for the City of Howe well were analyzed using the method of Walton (1962, p. 12). The calculation yields a hydraulic conductivity estimate of 2,752 gpd/ft2 (368 ft/day) for an aquifer thickness of 82 feet. This value was used to simulate the base case aquifer conditions. The effective porosity is 0.2, which is the default value presented in Table F-3 of the Idaho Wellhead

Protection Plan for mixed volcanic and sedimentary rocks (IDEQ, 1997, p. F-6). Base elevation of the aquifer was set to the elevation at the bottom of the well. The pumping rate is 2,692 ft3/day, which was estimated by multiplying the population that is served by the well (75) times the national average of 179 gal/day/person (USGS, 1995) times a safety factor of 1.5. The pumping rate without the factor of safety (1,795 ft3/day) is somewhat higher and therefore more conservative than the average rate report by the owner/operator (1,337 ft3/day). The areal recharge is 0.00009 ft/day (0.4 in./yr), based on an infiltration test conducted at the Idaho National Engineering and Environmental Laboratory by Cecil et al. (1992).

Final Model Input

Recharge along the basin margin was simulated using constant-flux line sinks, each of which was backed by a no-flow boundary. Ground water inflow and outflow was modeled using constant-head boundaries with initial heads based on a published potentiometric surface map (Briar et al., 1996).

Description of Public Water Systems

The delineated source water assessment area for the City of Howe wells can best be described as a pie shaped corridor originating at the well and extending in a northwesterly direction approximately 6.5 miles and widening to three miles (Figure 2). The actual data used in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the area surrounding the City of Howe wells is predominately-irrigated agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the <u>potential</u> for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in May and June 2002. The first phase involved identifying and documenting potential contaminant sources within the City of Howe source water assessment area (Figure 2) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the delineated areas.

During the enhanced phase of the contaminant inventory, the City of Howe did not have a water operator. While working with the City of Howe on a Drinking Water Protection Plan, Melinda Harper of the Idaho Rural Water Association noticed potential sources of contamination that should be added to the potential contaminant inventory. Her experience around water systems and involvement with the City of Howe's Drinking Water Protection Plan qualified her for this task. Items added by Melinda include private septic systems in the 0-3 YR TOT zone and irrigation laterals in the 0-10 YR TOT zone. Both potential contaminant sources increased the final susceptibility ranking for the City of Howe's well from moderate to high susceptibility to IOCs, VOCs, & SOCs. The final susceptibility ranking for microbials was not affected.

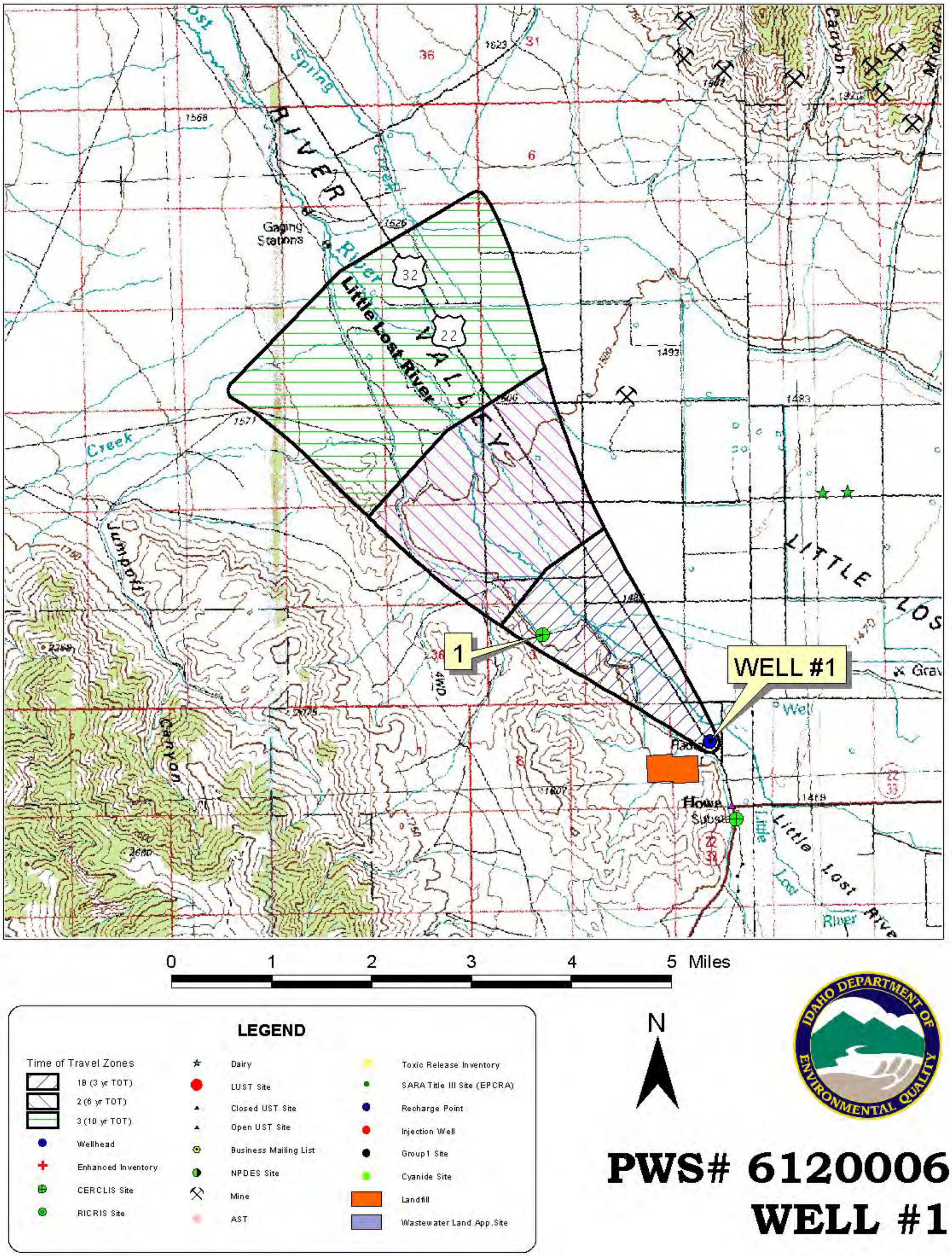
The delineated source water area for the well (Figure 2, Table 1) has their potential contaminants outlined below. Sources include a Comprehensive Environmental Response Compensation and Liability Act (CERCLA) site, the Little Lost River, and Highway 22/32. After conducting a background search on the EPA website and with their personnel, information concerning the CERCLA site could not be found.

Table 1. City of Howe, Well #1 and Well #2, Potential Contaminant Inventory

SITE	Source Description[1]	TOT[2] ZONE	Source of Information	Potential Contaminants[3]
1	CERCLA site	0-3 YR	Database Search	IOC, VOC, SOC, microbials
	Private septic systems	0-3 YR	EPCI	IOC, VOC, SOC, microbials
	Highway 22/32	0-10 YR	GIS Map	IOC, VOC, SOC, microbials
	Little Lost River	0-10 YR	GIS Map	IOC, VOC, SOC, microbials
	Irrigation Laterals	0-10 YR	EPCI	IOC, VOC, SOC, microbials

[1] CERCLA = Comprehensive Environmental Response Compensation and Liability Act
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, SOC = synthetic organic chemical, VOC = volatile organic chemical

Figure 2. Howe Townsite Delineation Map and Potential Contaminant Source Locations



Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The City of Howe well rated moderate for hydrologic sensitivity. Positively affecting the score is the presence of an aquitard, and a vadose zone that contains a high percentage if impermeable lithologies. The score was increased because the water table is less than 300 feet deep, and area soils are characterized as being moderately- to highly drained.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

City of Howe's well rated high for system construction. According to the well log, the well was constructed in 1984 to a depth of 294 feet. A 16-inch casing was set into gray basalt at 71 feet, and a 10-inch casing was perforated with a torch between 280 feet and 293 feet and seated into soft porous limestone. An annular seal extends 20 feet into gravel. Static water level was measured at 212 feet, and the well produced 200 gallons per minute during a 24-hour test.

The well is located outside of the 100-year floodplain, positively affecting the score. However, according to the well log, the well's highest production comes from less than 100 feet below static water levels, and the casings and annular seal do not extend into low permeability units. In addition, because the sanitary survey was not available during this report, it is unknown if the wellhead and surface seal are maintained to code.

Current PWS well construction standards are more stringent than when the wells were constructed. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the regulations deal with screening requirements, aquifer pump tests, use of a downturned casing vent, and thickness of casing. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Ten-inch diameter wells require a casing thickness of 0.365 inches, while sixteen-inch diameter wells should be 0.375 inches thick. Although the well may have met regulations at the time of its construction, the well was assessed an additional system construction point because it did not meet the current, stricter standards.

Potential Contaminant Source and Land Use

The well rated high for IOCs, VOCs, SOCs, and moderate for microbials. The large amount of irrigated land surrounding the well, Highway 22/32, the Little Lost River, and the CERCLA site contributed to the scores.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a wellhead will automatically lead to a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) contribute greatly to the overall ranking.

Table 2. Summary of City of Howe Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well	H	H	H	H	M	M	H	H	H	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, both the City of Howe well rated high for IOCs, VOCs, SOCs, and moderate for microbials. System construction rated high and hydrologic sensitivity rated moderate for the well. Land use scores were high for IOCs, VOCs, SOCs, and moderate for microbials.
No SOCs or VOCs have ever been detected in the tested water. Traces of the IOCs fluoride, zinc, barium, beryllium, chromium, sodium, magnesium, calcium, iron, and zinc have been detected in the well, as well as nitrate in concentrations less than 1.4 ppm and arsenic in concentrations of 10 ppb. The MCL for nitrate is 10 ppm and arsenic's revised MCL is 10 ppb. Total coliform has been detected in the distribution system three times between July and September 1993, but no more detections have occurred since then.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For City of Howe, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. Actions should be taken to keep a 50-foot radius circle clear around the wellheads. Any spills within the delineation should be carefully monitored and dealt with. As much of the designated protection area is outside the direct jurisdiction City of Howe, making collaboration and partnerships with state and local agencies and industry groups critical to the success of drinking water protection. The wells should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A public education program should be a primary focus of any drinking water protection plan as the delineation is near residential land use areas. Public education topics could include proper household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. As the Little Lost River is within the delineation, being on an emergency call list might be a consideration. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineation; therefore the Department of Transportation should be involved in protection activities.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office	(208) 528-2650
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mlharper@idahoruralwater.com) for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Cecil, L.D., J.R. Pittman, T.M. Beasley, R.L. Michel, P.W. Kubik, P. Sharma, U. Fehn, and H. Gove, 1992, Water Infiltration Rates in the Unsaturated Zone at the Idaho National Engineering Laboratory Estimated from Hhlorine-36 and Tritium Profiles, and Neutron Logging, Y.K. Kkharak and A.S. Meest, eds., Proceedings of the 7th International Symposium on Water Rock Interaction – WRI –7, Park City, Utah.

Clebsch, A. Jr., H.A. Waite, and S.O. Decker, 1974, The Availability of Water in the Little Lost River Basin, Idaho, Water Information Bulletin No. 37, Idaho Department of Water Resources, Idaho.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1995. Groundwater Under Direct Influence (GWUDI) Field Survey Report.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1999, Idaho Source Water Assessment Plan, October, 39 p.

Idaho Division of Environmental Quality, 1997, Idaho Wellhead Protection Plan, Idaho Wellhead Protection Work Group, February.

Kraemer, S.R., H.M. Haitjema, and V.A. Kelson, 2000, Working with WhAEM2000 Source Water Assessment for a Glacial Outwash Well field, Vincennes, Indiana, U.S. Environmental Protection Agency, Office of Research, EPA/600/R-00/022, 50 p.

Attachment A

City of Howe
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : CITY OF HOWE Well# : WELL
Public Water System Number 6120006 08/30/2002 1:50:47 PM

1. System Construction		SCORE
Drill Date	03/23/1984	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
	Total System Construction Score	5

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	NO	0
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0
	Total Hydrologic Score	3

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	5	5	5	5
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	4	4	4	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	16	16	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		25	25	25	14
4. Final Susceptibility Source Score		13	13	13	12
5. Final Well Ranking		High	High	High	Moderate